

also gives the altitude of Weather Bureau anemometers above ground.

Following are the velocities of 50 miles and over per hour registered during the month:

Maximum wind velocities.

| Stations. | Date. | Velocity. | Direction. | Stations. | Date. | Velocity. | Direction. |
|----------------------------|-------|-----------|------------|------------------------------|-------|-----------|------------|
| Block Island, R. I. | 8 | 77 | ne. | Mount Tamalpais, Cal. | 9 | 50 | nw. |
| Do. | 4 | 58 | n. | Do. | 24 | 50 | n. |
| Do. | 15 | 52 | n.w. | Do. | 25 | 55 | n. |
| Buffalo, N. Y. | 10 | 54 | sw. | Do. | 27 | 62 | n. |
| Do. | 14 | 54 | s. | Nantucket, Mass. | 4 | 54 | ne. |
| Do. | 31 | 51 | w. | Neah Bay, Wash. | 3 | 58 | e. |
| Carson City, Nev. | 5 | 50 | sw. | Do. | 4 | 53 | w. |
| Cheyenne, Wyo. | 28 | 66 | w. | Do. | 26 | 60 | w. |
| Chicago, Ill. | 31 | 54 | n.w. | New York, N. Y. | 4 | 65 | n.w. |
| Denver, Colo. | 18 | 52 | n. | Do. | 10 | 60 | w. |
| El Paso, Tex. | 12 | 52 | w. | Do. | 11 | 65 | n.w. |
| Helena, Mont. | 21 | 55 | sw. | Do. | 27 | 50 | n.w. |
| Do. | 26 | 56 | sw. | Do. | 31 | 66 | se. |
| Lexington, Ky. | 18 | 50 | s. | Pensacola, Fla. | 28 | 60 | sw. |
| Modena, Utah. | 6 | 54 | sw. | Point Reyes Light, Cal. | 23 | 60 | n.w. |
| Mount Tamalpais, Cal. | 3 | 60 | w. | Salt Lake City, Utah. | 15 | 58 | nw. |
| Do. | 5 | 56 | w. | Salt Lake City, Utah. | 26 | 50 | nw. |
| Do. | 6 | 55 | n.w. | Winnemucca, Nev. | 5 | 70 | s. |

ATMOSPHERIC ELECTRICITY.

Numerical statistics relative to auroras and thunderstorms are given in Table IV, which shows the number of stations from which meteorological reports were received, and the number of such stations reporting thunderstorms (T) and auroras (A) in each State and on each day of the month, respectively.

Thunderstorms.—Reports of 336 thunderstorms were received during the current month as against 261 in 1900 and 353 during the preceding month.

The dates on which the number of reports of thunderstorms for the whole country were most numerous were: 13th, 112; 14th, 35; 12th, 34; 8th, 32.

Reports were most numerous from: Louisiana, 38; Missouri, 36; Arkansas and Texas, 32.

Auroras.—The evenings on which bright moonlight must have interfered with observations of faint auroras are assumed to be the four preceding and following the date of full moon, viz: 21st to 29th.

In Canada.—Auroras were reported at Swift Current on the 7th, and 19th. A thunderstorm was reported from New Westminster on the 3d.

DESCRIPTION OF TABLES AND CHARTS.

By ALFRED J. HENRY, Professor of Meteorology.

Table I gives, for about 145 Weather Bureau stations making two observations daily and for about 25 others making only one observation, the data ordinarily needed for climatological studies, viz, the monthly mean pressure, the monthly means and extremes of temperature, the average conditions as to moisture, cloudiness, movement of the wind, and the departures from normals in the case of pressure, temperature, and precipitation, the total depth of snowfall, and the mean wet-bulb temperatures. The altitudes of the instruments above ground are also given.

Table II gives, for about 2,700 stations occupied by voluntary observers, the highest maximum and the lowest minimum temperatures, the mean temperature deduced from the average of all the daily maxima and minima, or other readings, as indicated by the numeral following the name of the station; the total monthly precipitation, and the total depth in inches of any snow that may have fallen. When the spaces in the snow column are left blank it indicates that no snow has fallen, but when it is possible that there may have been snow of which no record has been made, that fact is indicated by leaders, thus (....).

Table III gives, for all stations that make observations at 8 a. m. and 8 p. m., the four component directions and the resultant directions based on these two observations only and without considering the velocity of the wind. The total movement for the whole month, as read from the dial of the Robinson anemometer, is given for each station in Table I. By adding the four components for the stations comprised in any geographical division the average resultant direction for that division can be obtained.

Table IV gives the total number of stations in each State from which meteorological reports of any kind have been received, and the number of such stations reporting thunderstorms (T) and auroras (A) on each day of the current month.

Table V gives a record of rains whose intensity at some period of the storm's continuance equaled or exceeded the following rates:

Duration, minutes.. 5 10 15 20 25 30 35 40 45 50 60 80 100 120
Rates pr. hr. (ins.).. 3.00 1.80 1.40 1.20 1.00 0.94 0.90 0.86 0.84 0.75 0.60 0.54 0.50

In the northern part of the United States, especially in the

colder months of the year, rains of the intensities shown in the above table seldom occur. In all cases where no storm of sufficient intensity to entitle it to a place in the full table has occurred, the greatest rainfall of any single storm has been given, also the greatest hourly fall during that storm.

Table VI gives, for about 30 stations furnished by the Canadian Meteorological Service, Prof. R. F. Stupart, director, the means of pressure and temperature, total precipitation and depth of snowfall, and the respective departures from normal values, except in the case of snowfall.

Table VII gives the heights of rivers referred to zeros of gages.

NOTES EXPLANATORY OF THE CHARTS.

Chart I, tracks of centers of high areas, and Chart II, tracks of centers of low areas, are constructed in the same way. The Roman numerals show number and chronological order of highs (Chart I) and lows (Chart II). The figures within the circles show the days of the month; the letters a and p indicate, respectively, the 8 a. m. and 8 p. m., seventy-fifth meridian time, observations. Within each circle is also given (Chart I) the highest barometric reading and (Chart II) the lowest pressure at or near the center at that time.

Chart III.—Total precipitation. The scale of shades showing the depth of rainfall is given on the chart itself. For isolated stations the rainfall is given in inches and tenths, when appreciable; otherwise, a "trace" is indicated by a capital T, and no rain at all, by 0.0.

Chart IV.—Sea-level pressure, temperature, and resultant surface winds. The wind directions on this Chart are the computed resultants of observations at 8 a. m. and 8 p. m., daily; the resultant duration is shown by figures attached to each arrow. The temperatures are the means of daily maxima and minima and are reduced to sea level. The pressures are the means of 8 a. m. and 8 p. m. observations, daily, and are reduced to sea level and to standard gravity. The reduction for 30 inches of the mercurial barometer, as formerly shown by the marginal figures for each degree of latitude, has already been applied.

Chart V.—Hydrographs for seven principal rivers of the United States.

Chart VI.—Surface temperatures; maximum, minimum, and mean. Lines of equal monthly mean temperature in red; lines of equal maximum temperature in black; and lines of equal minimum temperature (dotted) also in black.

Chart VII.—Percentage of sunshine. The average cloudiness at each Weather Bureau station is determined by numerous personal observations during the day. The difference between the observed cloudiness and 100, it is assumed, repre-

sents the percentage of sunshine, and the values thus obtained have been used in preparing Chart VII.

Chart VIII.—West Indian monthly isobars, isotherms, and resultant winds.

Chart IX.—The total snowfall. This is based on the reports from regular and voluntary observers, and shows the depth of the snowfall during the month in inches. In general, the depth is shown by lines inclosing areas of equal snowfall, but in special cases figures are also given.

Chart X.—Snow on ground on December 31, 1901.

TABLE II.—*Climatological record of voluntary and other cooperating observers—Continued.*

| Stations. | Temperature. (Fahrenheit.) | | | Precipita- tion. | | EXPLANATION OF SIGNS. |
|--|-------------------------------|----------|-------|--------------------------|----------------------------|---|
| | Maximum. | Minimum. | Mean. | Rain and melted snow. | Total depth of snow. | |
| <i>Ohio,</i> Benton Ridge..... | o | o | o | Ins. | Ins. | * Extremes of temperature from observed readings of dry thermometer. |
| Colebrook ^c | 58 | 12 | 34.0 | 1.23 | 2.4 | A numeral following the name of a station indicates the hours of observation from which the mean temperature was obtained, thus: |
| <i>South Dakota.</i> Rochford..... | 68 | 4 | 35.4 | 0.48 | 2.0 | ¹ Mean of 7 a. m. + 2 p. m. + 8 p. m. + 9 p. m. + 4. ² Mean of 8 a. m. + 8 p. m. + 2. |
| <i>Texas.</i> Shaefers Ranch ^f | 87 | 45 | 68.4 | 0.82 | | ³ Mean of 7 a. m. + 7 p. m. + 2. ⁴ Mean of 6 a. m. + 6 p. m. + 2. |
| <i>Utah.</i> Lasal..... | 81 | 20 | 48.6 | 0.01 | | ⁵ Mean of 7 a. m. + 2 p. m. + 2. ⁶ Mean of readings at various hours reduced to true daily mean by special tables. |
| <i>Wisconsin.</i> Racine..... | 66 | 16 | 36.8 | 0.87 | | ⁷ Mean from hourly readings of thermograph. ⁸ Mean of sunrise and noon. |
| <i>Porto Rico.</i> Vieques..... | 90 | 74 | 82.2 | 3.25 | | ⁹ Mean of sunrise, noon, sunset, and midnight. The absence of a numeral indicates that the mean |
| | | | | | | temperature has been obtained from daily readings of the maximum and minimum thermometers. |
| | | | | | | An italic letter following the name of a station, as "Livingston <i>a</i> ," "Livingston <i>b</i> ," indicates that two or more observers, as the case may be, are reporting from the same station. A small roman letter following the name of a station, or in figure columns, indicates the number of days missing from the record; for instance "z" denotes 14 days missing. |
| | | | | | | No note is made of breaks in the continuity of temperature records when the same do not exceed two days. All known breaks, of whatever duration, in the precipitation record receive appropriate notice. |
| | | | | | | CORRECTIONS. |
| | | | | | | November, 1901. Texas, New Braunfels, make mean temperature 61.6 instead of 60.9. Ohio, Oberlin, make precipitation 2.86 instead of 2.31. |

TABLE V.—*Accumulated amounts of precipitation for each 5 minutes, etc.*—Continued.

***Self-register not working.**

[†] No precipitation.

TABLE VI.—Data furnished by the Canadian Meteorological Service, December, 1901.

Blank page retained for pagination